

Global Innovation Index 2023

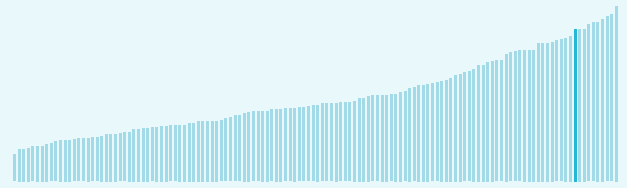


The Global Innovation Index (GII) **ranks world economies according to their innovation capabilities.**

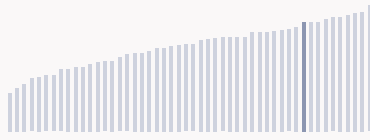
Consisting of **roughly 80 indicators**, grouped into innovation inputs and outputs, the GII **aims to capture the multi-dimensional facets of innovation.**

Republic of Korea ranking in the Global Innovation Index 2023

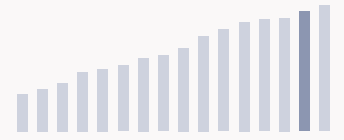
> Republic of Korea ranks **10th** among the 132 economies featured in the GII 2023.



> Republic of Korea ranks **10th** among the 50 high-income group economies.



> Republic of Korea ranks **2nd** among the 16 economies in South East Asia, East Asia, and Oceania.



> Republic of Korea GII Ranking (2020-2023)

The table shows the rankings of Republic of Korea over the past four years. Data availability and changes to the GII model framework influence year-on-year comparisons of the GII rankings. The statistical confidence interval for the ranking of Republic of Korea in the GII 2023 is between ranks 7 and 10.

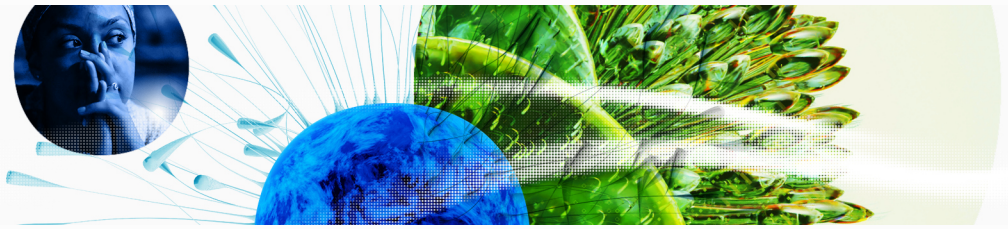
	GII Position	Innovation Inputs	Innovation Outputs
2020	10th	10th	10th
2021	5th	9th	5th
2022	6th	16th	4th
2023	10th	12th	7th

Republic of Korea performs better in innovation outputs than innovation inputs in 2023.

This year Republic of Korea ranks 12th in innovation inputs. This position is higher than last year.

Republic of Korea ranks 7th in innovation outputs. This position is lower than last year.

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→ Expected vs. observed innovation performance

The bubble chart below shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The trend line gives an indication of the expected innovation performance according to income level. Economies appearing above the trend line are performing better than expected and those below are performing below expectations.



> Republic of Korea is an innovation leader, ranking in the top 25 of the GII.

> Innovation overperformers relative to their economic development



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→ Effectively translating innovation investments into innovation outputs

The chart below shows the relationship between innovation inputs and innovation outputs. Economies above the line are effectively translating costly innovation investments into more and higher-quality outputs.



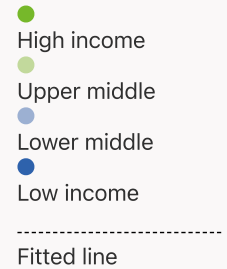
> Republic of Korea produces more innovation outputs relative to its level of innovation investments.

> Relationship between innovation inputs and outputs

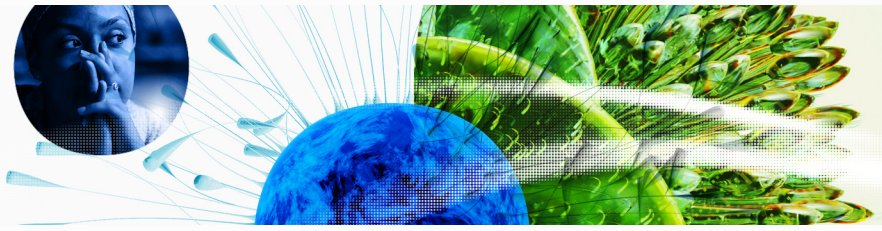
↑ Output score



→ Input score

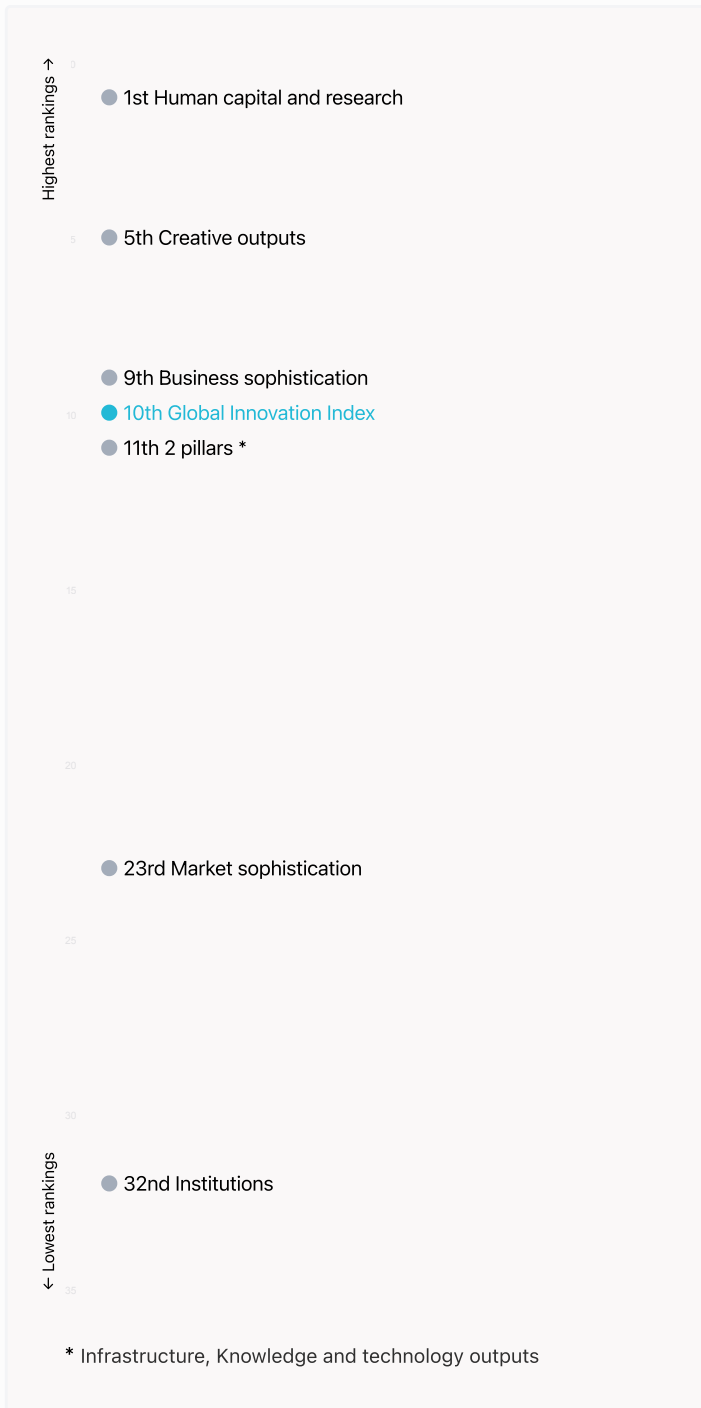


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→ Overview of Republic of Korea's rankings in the seven areas of the GII in 2023

The chart shows the ranking for each of the seven areas that the GII comprises. The strongest areas for Republic of Korea are those that rank above the GII (shown in blue) and the weakest are those that rank below.




> Highest rankings

Republic of Korea ranks highest in Human capital and research (1st), Creative outputs (5th) and Business sophistication (9th).

> Lowest rankings

Republic of Korea ranks lowest in Institutions (32nd), Market sophistication (23rd) and Infrastructure, Knowledge and technology outputs (11th).

 The full WIPO Intellectual Property Statistics profile for Republic of Korea can be found on [this link](#).

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→ Benchmark of Republic of Korea against other country groupings for each of the seven areas of the GII Index

The charts show the relative position of Republic of Korea (blue bar) against other country groupings (grey bars), for each of the seven areas of the GII Index.

> High-Income economies

Republic of Korea performs above the high-income group average in Knowledge and technology outputs, Creative outputs, Business sophistication, Market sophistication, Human capital and research, Infrastructure.

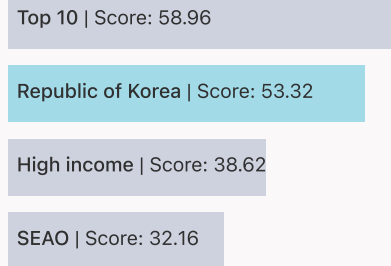


> South East Asia, East Asia, And Oceania

Republic of Korea performs above the regional average in all the pillars.

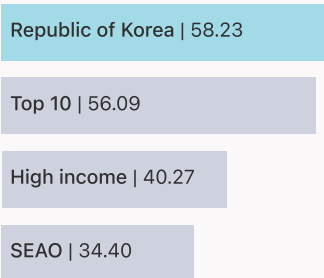


Knowledge and technology outputs

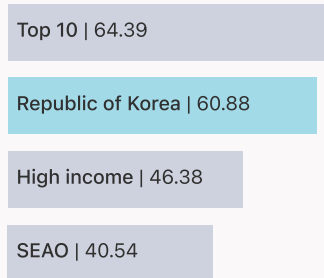


* South East Asia, East Asia, and Oceania

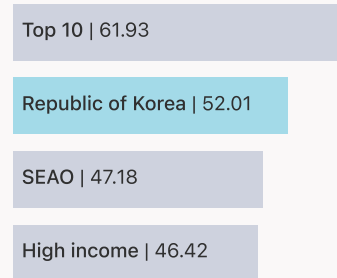
Creative outputs



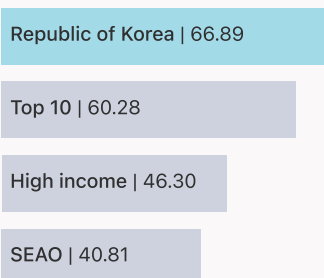
Business sophistication



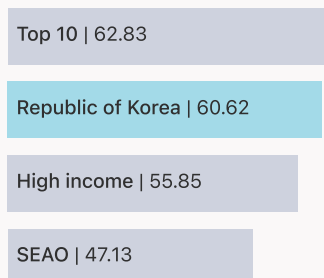
Market sophistication



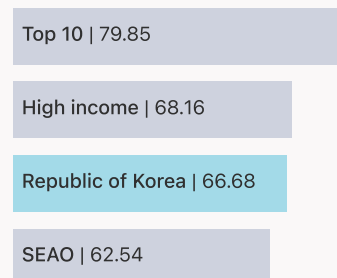
Human capital and research



Infrastructure



Institutions





→ Innovation strengths and weaknesses in Republic of Korea

The table below gives an overview of the indicator strengths and weaknesses of Republic of Korea in the GII 2023.



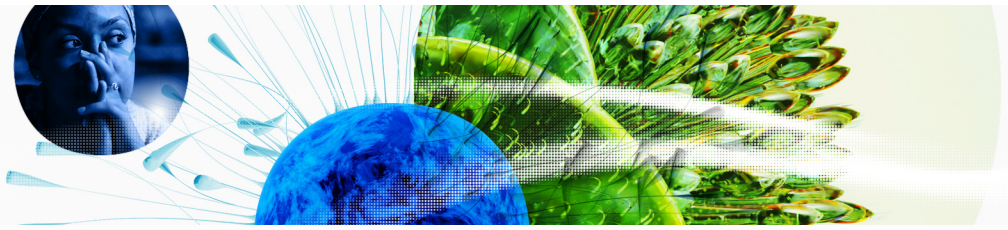
> Republic of Korea's main innovation strengths are **Patent families/bn PPP\$ GDP (rank 1)**, **Patents by origin/bn PPP\$ GDP (rank 1)** and **PCT patents by origin/bn PPP\$ GDP (rank 1)**.

Strengths

Weaknesses

Rank	Code	Indicator name	Rank	Code	Indicator name
1	5.2.5	Patent families/bn PPP\$ GDP	111	1.2.3	Cost of redundancy dismissal
1	6.1.1	Patents by origin/bn PPP\$ GDP	106	5.3.4	FDI net inflows, % GDP
1	6.1.2	PCT patents by origin/bn PPP\$ GDP	94	4.3.1	Applied tariff rate, weighted avg., %
1	5.3.5	Research talent, % in businesses	90	3.3.1	GDP/unit of energy use
2	5.1.3	GERD performed by business, % GDP	74	5.3.3	ICT services imports, % total trade
2	2.3.2	Gross expenditure on R&D, % GDP	69	5.2.3	GERD financed by abroad, % GDP
2	2.3.1	Researchers, FTE/mn pop.	68	6.3.4	ICT services exports, % total trade
3	2.1.2	Government funding/pupil, secondary, % GDP/cap	65	6.2.3	Software spending, % GDP
3	3.1.3	Government's online service	63	4.2.3	VC recipients, deals/bn PPP\$ GDP
3	7.1.4	Industrial designs by origin/bn PPP\$ GDP	58	2.2.3	Tertiary inbound mobility, %
4	3.1.2	ICT use			
4	2.2.1	Tertiary enrolment, % gross			

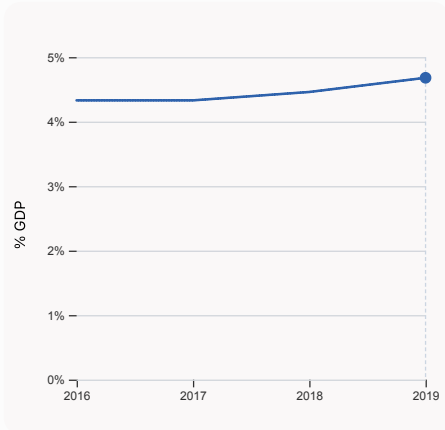
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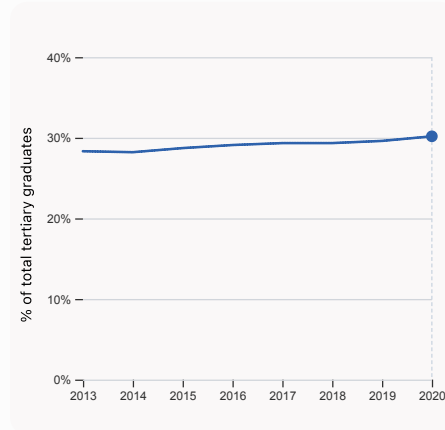
→ Republic of Korea's innovation system

As far as practicable, the plots below present unscaled indicator data.

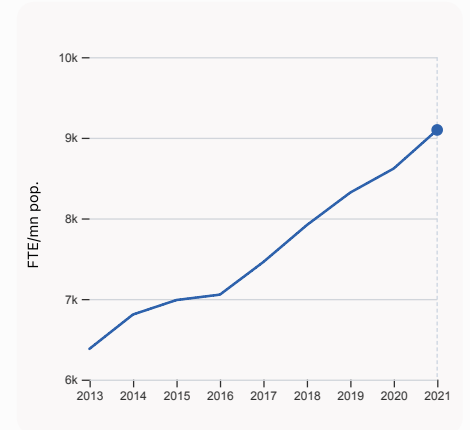
> Innovation inputs in Republic of Korea



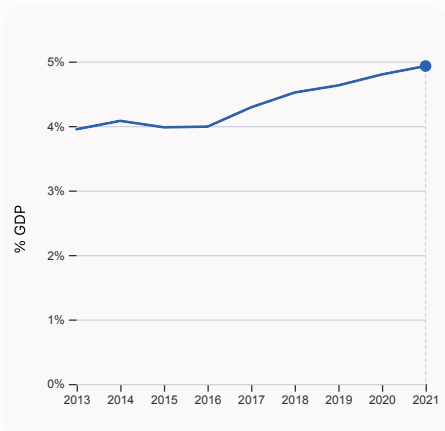
2.1.1 Expenditure on education, % GDP was equal to 4.68% GDP in 2019, up by 0.22 percentage points from the year prior – and equivalent to an indicator rank of 46.



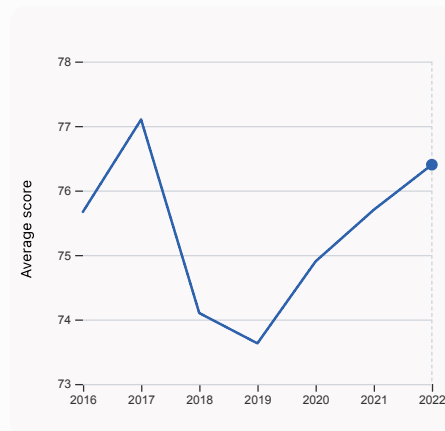
2.2.2 Graduates in science and engineering, % was equal to 30.18% of total tertiary graduates in 2020, up by 0.57 percentage points from the year prior – and equivalent to an indicator rank of 18.



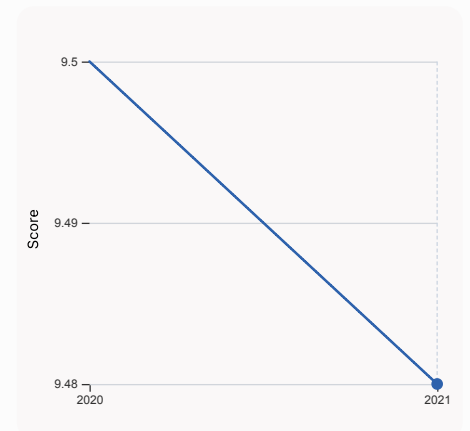
2.3.1 Researchers, FTE/mn pop. was equal to 9,097.07 FTE/mn pop. in 2021, up by 5.56% from the year prior – and equivalent to an indicator rank of 2.



2.3.2 Gross expenditure on R&D, % GDP was equal to 4.93% GDP in 2021, up by 0.13 percentage points from the year prior – and equivalent to an indicator rank of 2.

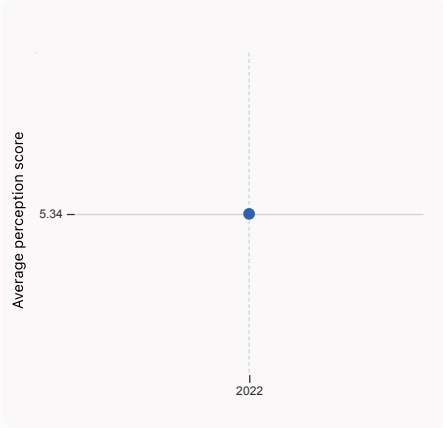
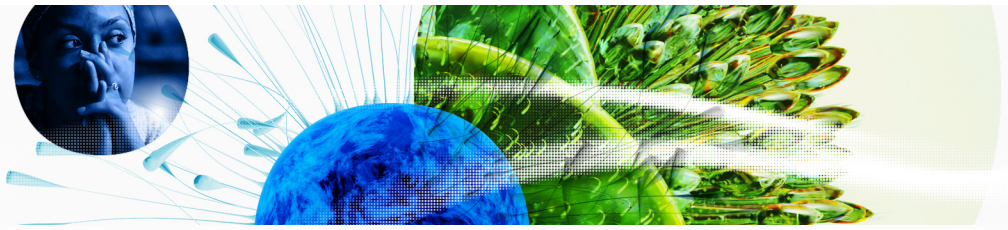


2.3.4 QS university ranking, top 3 was equal to an average score of 76.4 for the top 3 universities in 2022, up by 0.92% from the year prior – and equivalent to an indicator rank of 10.

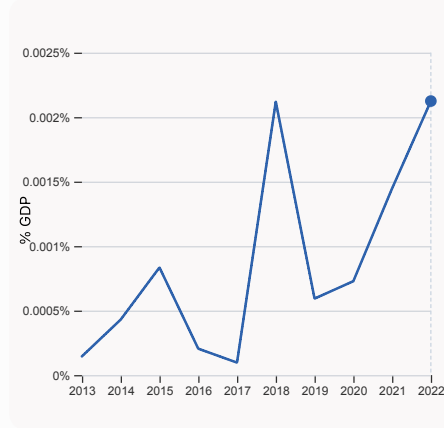


3.1.1 ICT access was equal to a score of 9.48 in 2021, down by 0.21% from the year prior – and equivalent to an indicator rank of 14.

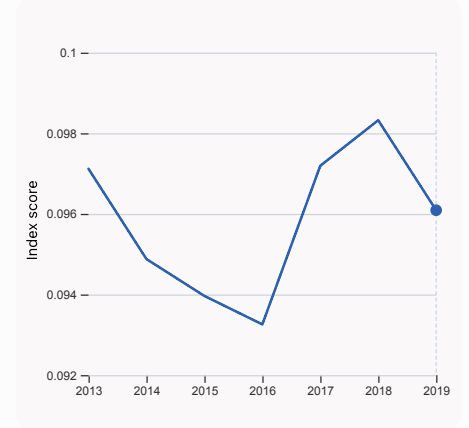
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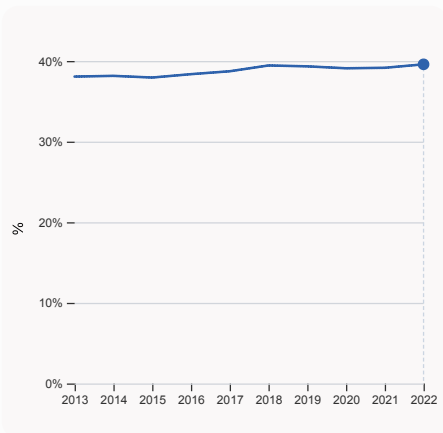
4.1.1 Finance for startups and scaleups was equal to an average perception score of 5.34 in 2022, equivalent to an indicator rank of 23.



4.2.4 VC received, value, % GDP was equal to 0.00212% GDP in 2022, up by 0.00068 percentage points from the year prior – and equivalent to an indicator rank of 41.



4.3.2 Domestic industry diversification was equal to an index score of 0.096 in 2019, down by 2.27% from the year prior – and equivalent to an indicator rank of 12.

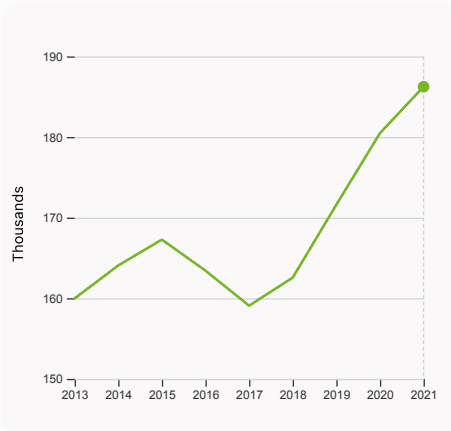


5.1.1 Knowledge-intensive employment, % was equal to 39.59% in 2022, up by 0.43 percentage points from the year prior – and equivalent to an indicator rank of 31.

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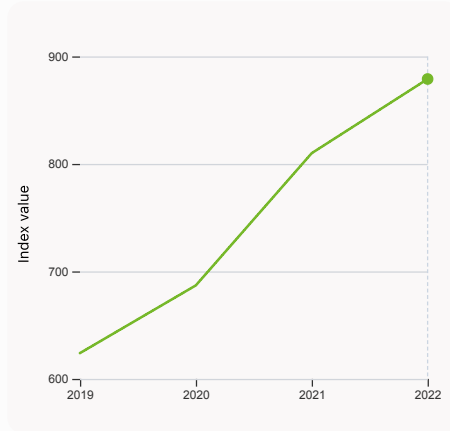


> Innovation outputs in Republic of Korea



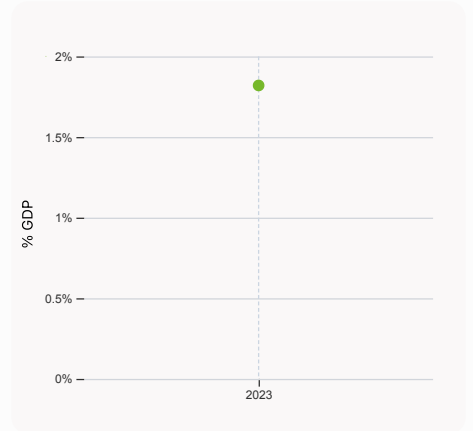
6.1.1 Patents by origin

was equal to 186.25 Thousands in 2021, up by 3.2% from the year prior – and equivalent to an indicator rank of 1.



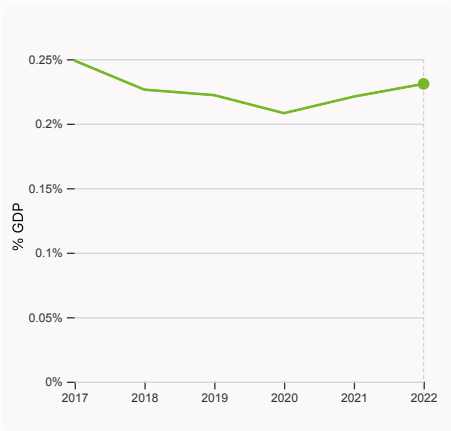
6.1.5 Citable documents H-index

was equal to an index value of 879 in 2022, up by 8.52% from the year prior – and equivalent to an indicator rank of 17.



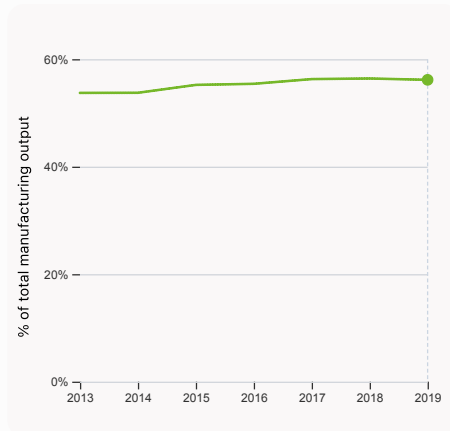
6.2.2 Unicorn valuation, % GDP

was equal to 1.82 % GDP in 2023 – and equivalent to an indicator rank of 24.



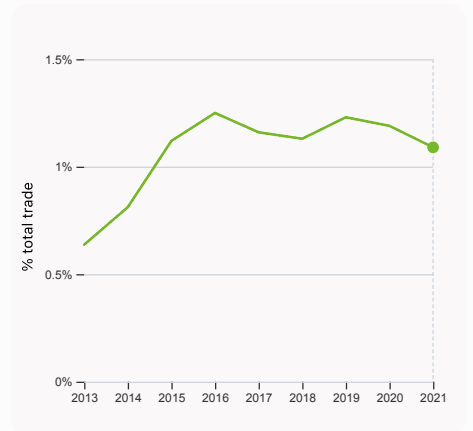
6.2.3 Software spending, % GDP

was equal to 0.231% GDP in 2022, up by 0.0099 percentage points from the year prior – and equivalent to an indicator rank of 65.



6.2.4 High-tech manufacturing, %

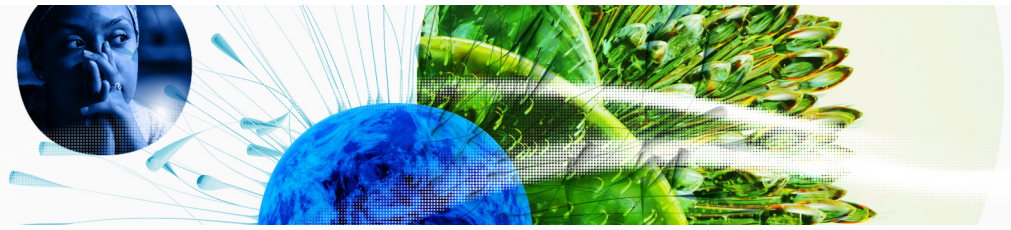
was equal to 56.16% of total manufacturing output in 2019, down by 0.25 percentage points from the year prior – and equivalent to an indicator rank of 7.



6.3.1 Intellectual property receipts, % total trade

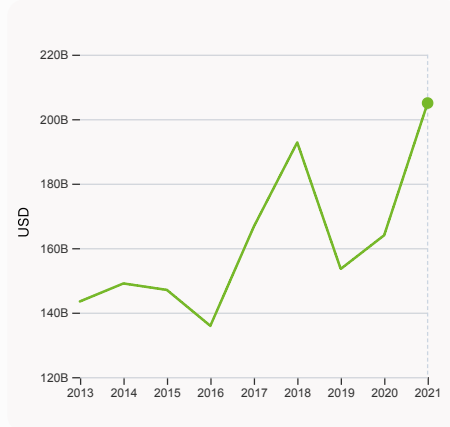
was equal to 1.09% total trade in 2021, down by 0.1 percentage points from the year prior – and equivalent to an indicator rank of 20.

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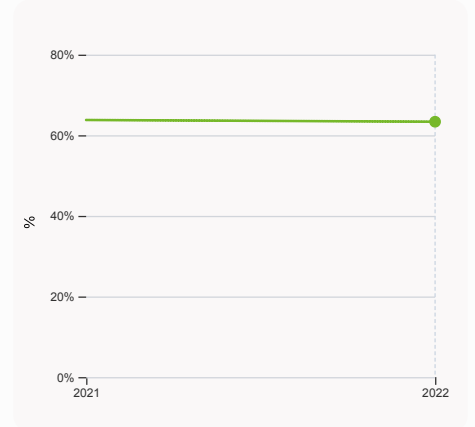
6.3.2 Production and export complexity

was equal to a score of 1.95 in 2020, down by 5.34% from the year prior – and equivalent to an indicator rank of 4.



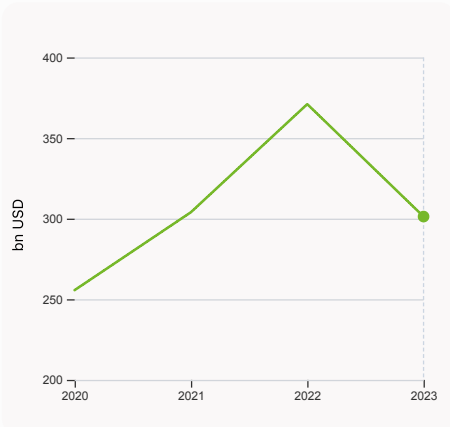
6.3.3 High-tech exports

was equal to 204,992,223,633 USD in 2021, up by 25.0051% from the year prior – and equivalent to an indicator rank of 6.



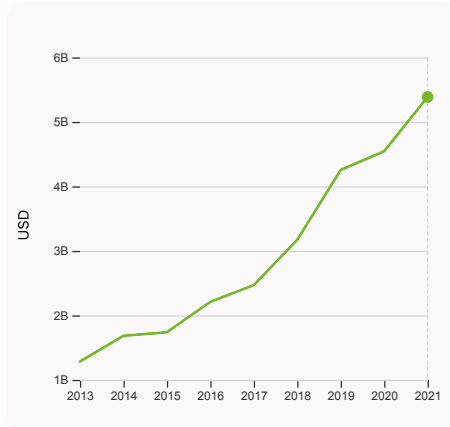
7.1.1 Intangible asset intensity, top 15, %

was equal to 63.36% in 2022, down by 0.43 percentage points from the year prior – and equivalent to an indicator rank of 32.



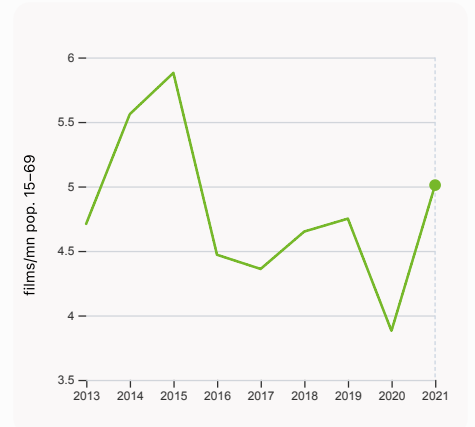
7.1.3 Global brand value, top 5,000

was equal to 301.295 bn USD in 2023, down by 18.79% from the year prior – and equivalent to an indicator rank of 6.



7.2.1 Cultural and creative services exports

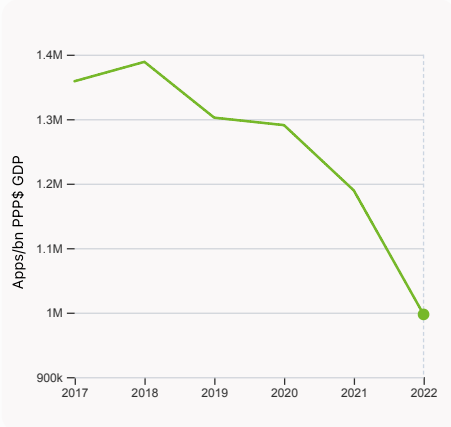
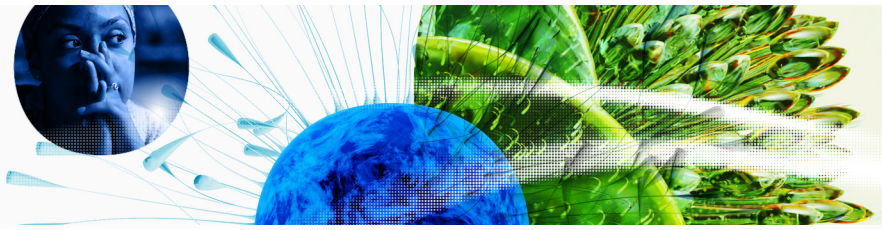
was equal to 5,386,393,000 USD in 2021, up by 18.52% from the year prior – and equivalent to an indicator rank of 42.



7.2.2 National feature films/mn pop. 15-69

was equal to 5.01 films/mn pop. 15-69 in 2021, up by 29.12% from the year prior – and equivalent to an indicator rank of 23.

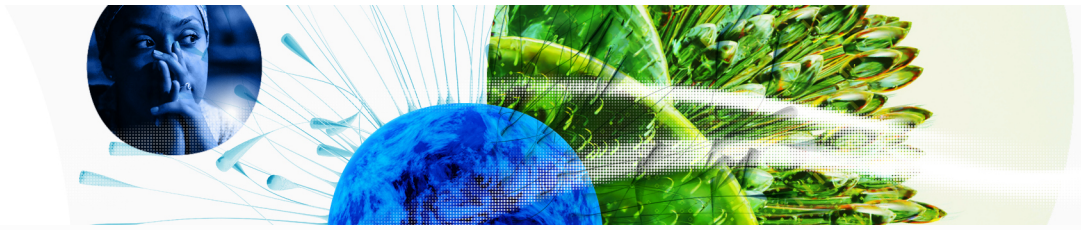
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7.3.4 Mobile app creation/bn PPP\$ GDP

was equal to 997,236.42 Apps/bn PPP\$ GDP in 2022, down by 16.17% from the year prior – and equivalent to an indicator rank of 15.

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→ Republic of Korea's innovation top performers

> 2.3.3 Global corporate R&D investors from Republic of Korea

Rank	Firm	Industry	R&D	R&D Growth	R&D Intensity
			[mn EUR]	[%]	[%]
6	SAMSUNG ELECTRONICS	Electronic & Electrical Equipment	16,813	6	8
57	SK HYNIX	Technology Hardware & Equipment	3,087	25	10
65	LG ELECTRONICS	Leisure Goods	2,677	2	5
79	HYUNDAI MOTOR	Automobiles & Parts	2,305	0	3

Source: European Commission's Joint Research Centre (<https://iri.jrc.ec.europa.eu/scoreboard/2022-eu-industrial-rd-investment-scoreboard>).

Note: European Commission's Joint Research Centre ranks the top 2,500 firms by R&D investment annually.

> 2.3.4 QS university ranking of Republic of Korea's top universities

Rank	University	Score
29	SEOUL NATIONAL UNIVERSITY	82.20
42	KAIST - KOREA ADVANCED INSTITUTE OF SCIENCE & TECHNOLOGY	79.30
71	POHANG UNIVERSITY OF SCIENCE AND TECHNOLOGY (POSTECH)	67.70

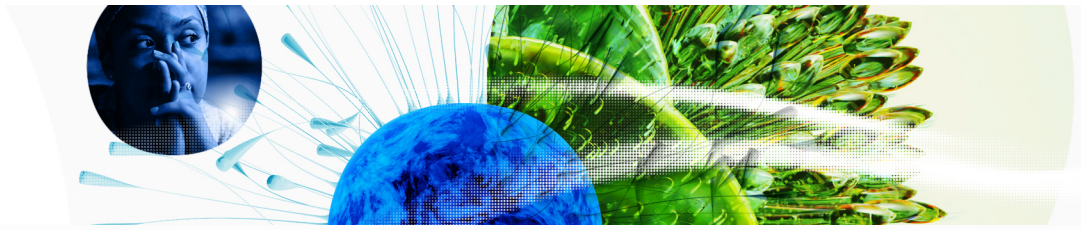
Source: QS Quacquarelli Symonds Ltd (<https://www.topuniversities.com/university-rankings/world-university-rankings/2023>).

Note: QS Quacquarelli Symonds Ltd annually assesses over 1,200 universities across the globe and scores them between [0,100]. Ranks can represent a single value "x", a tie "x=" or a range "x-y".

> 6.2.2 Top Unicorn Companies in Republic of Korea

Rank	Unicorn Company	Industry	City	Valuation, bn USD
1	TOSS	Fintech	Seoul	7
2	YELLO MOBILE	Mobile & telecommunications	Seoul	4
3	KURLY	Supply chain, logistics, & delivery	Seoul	3

Source: CBInsights, Tracker – The Complete List of Unicorn Companies: <https://www.cbinsights.com/research-unicorn-companies>



> 7.1.1 Top 15 intangible-asset intensive companies in Republic of Korea

Rank	Firm	Intensity, %
1	LG ENERGY SOLUTION LTD	92.77
2	SAMSUNG BIOLOGICS CO LTD	89.15
3	COUPANG INC	89.97

Source: Brand Finance (<https://brandirectory.com/reports/gift-2022>).

Note: Brand Finance only provides within economy ranks.

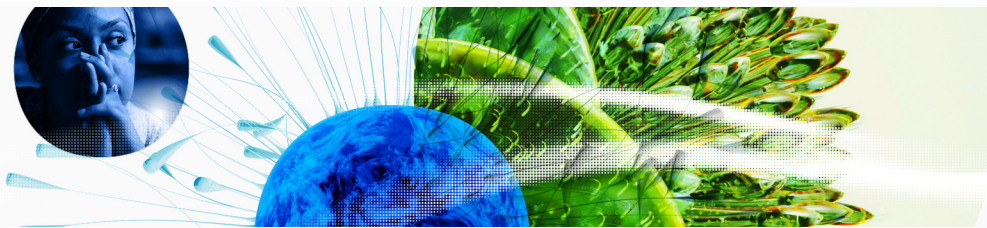
> 7.1.3 Top 5,000 companies in Republic of Korea with highest global brand value

Rank	Brand	Industry	Brand Value, mn USD
1	SAMSUNG GROUP	Tech	99,659.3
2	HYUNDAI GROUP	Automobiles	27,253.4
3	SK GROUP	Telecoms	22,538.8

Source: Brand Finance (<https://brandirectory.com>).

Note: Rank corresponds to within economy ranks.

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GII 2023 rank

10

Republic of Korea

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$
7	12	High	SEAO	51.8	2,765.8	53,574.2

Score / Value Rank

Score / Value Rank

Institutions 66.7 32

1.1 Institutional environment	73.9	19	
1.1.1 Operational stability for businesses*	72.2	22	
1.1.2 Government effectiveness*	75.6	16	
1.2 Regulatory environment	66.6	53	◇
1.2.1 Regulatory quality*	70.6	28	
1.2.2 Rule of law*	72.7	24	
1.2.3 Cost of redundancy dismissal	27.4	111	○ ◇
1.3 Business environment	59.5	34	
1.3.1 Policies for doing business*	52.0	58	◇
1.3.2 Entrepreneurship policies and culture*	67.1	17	

Human capital and research 66.9 1

2.1 Education	67.3	12	
2.1.1 Expenditure on education, % GDP	4.7	46	●
2.1.2 Government funding/pupil, secondary, % GDP/cap	36.3	3	●●
2.1.3 School life expectancy, years	16.6	26	
2.1.4 PISA scales in reading, maths and science	519.7	6	
2.1.5 Pupil-teacher ratio, secondary	11.8	52	
2.2 Tertiary education	46.0	17	
2.2.1 Tertiary enrolment, % gross	102.5	4	●●
2.2.2 Graduates in science and engineering, %	30.2	18	◆
2.2.3 Tertiary inbound mobility, %	3.7	58	○ ◇
2.3 Research and development (R&D)	87.3	1	●●
2.3.1 Researchers, FTE/mn pop.	9,097.1	2	●●
2.3.2 Gross expenditure on R&D, % GDP	4.9	2	●●
2.3.3 Global corporate R&D investors, top 3, mn US\$	88.8	5	
2.3.4 QS university ranking, top 3*	77.4	10	

Infrastructure 60.6 11

3.1 Information and communication technologies (ICTs)	95.7	1	●●
3.1.1 ICT access*	92.4	14	
3.1.2 ICT use*	98.1	4	●●
3.1.3 Government's online service*	98.1	3	●●
3.1.4 E-participation*	94.2	9	
3.2 General infrastructure	56.5	10	
3.2.1 Electricity output, GWh/mn pop.	11,597.6	12	
3.2.2 Logistics performance*	77.3	16	
3.2.3 Gross capital formation, % GDP	32.1	18	◆
3.3 Ecological sustainability	29.7	55	◇
3.3.1 GDP/unit of energy use	7.7	90	○
3.3.2 Environmental performance*	47.5	49	◇
3.3.3 ISO 14001 environment/bn PPP\$ GDP	3.3	28	

Market sophistication 52.0 23

4.1 Credit	64.7	11	
4.1.1 Finance for startups and scaleups*	66.7	23	
4.1.2 Domestic credit to private sector, % GDP	164.1	7	
4.1.3 Loans from microfinance institutions, % GDP	n/a	n/a	
4.2 Investment	17.4	42	◇
4.2.1 Market capitalization, % GDP	101.4	15	
4.2.2 Venture capital (VC) investors, deals/bn PPP\$ GDP	0.1	34	◇
4.2.3 VC recipients, deals/bn PPP\$ GDP	0.0	63	○ ◇
4.2.4 VC received, value, % GDP	0.0	41	◇
4.3 Trade, diversification, and market scale	73.9	16	
4.3.1 Applied tariff rate, weighted avg., %	5.5	94	○ ◇
4.3.2 Domestic industry diversification	97.8	12	●
4.3.3 Domestic market scale, bn PPP\$	2,765.8	14	

Business sophistication 60.9 9

5.1 Knowledge workers	75.1	3	●◆
5.1.1 Knowledge-intensive employment, %	39.6	31	◇
5.1.2 Firms offering formal training, %	n/a	n/a	
5.1.3 GERD performed by business, % GDP	3.9	2	●◆
5.1.4 GERD financed by business, %	76.1	4	◆
5.1.5 Females employed w/advanced degrees, %	21.4	28	
5.2 Innovation linkages	52.0	19	
5.2.1 University-industry R&D collaboration*	72.8	21	
5.2.2 State of cluster development*	70.4	22	
5.2.3 GERD financed by abroad, % GDP	0.0	69	○ ◇
5.2.4 Joint venture/strategic alliance deals/bn PPP\$ GDP	0.0	32	◇
5.2.5 Patent families/bn PPP\$ GDP	12.5	1	●◆
5.3 Knowledge absorption	55.6	11	
5.3.1 Intellectual property payments, % total trade	1.6	21	
5.3.2 High-tech imports, % total trade	17.2	13	
5.3.3 ICT services imports, % total trade	1.2	74	○ ◇
5.3.4 FDI net inflows, % GDP	0.7	106	○
5.3.5 Research talent, % in businesses	82.9	1	●◆

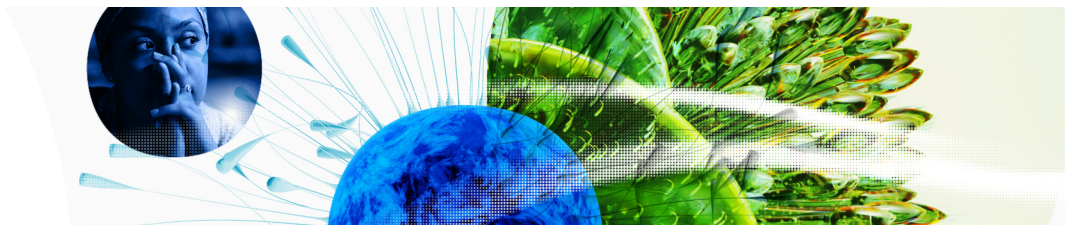
Knowledge and technology outputs 53.3 11

6.1 Knowledge creation	66.1	5	
6.1.1 Patents by origin/bn PPP\$ GDP	74.0	1	●◆
6.1.2 PCT patents by origin/bn PPP\$ GDP	8.0	1	●◆
6.1.3 Utility models by origin/bn PPP\$ GDP	1.4	14	
6.1.4 Scientific and technical articles/bn PPP\$ GDP	n/a	n/a	
6.1.5 Citable documents H-index	46.5	17	
6.2 Knowledge impact	45.0	22	
6.2.1 Labor productivity growth, %	1.2	58	
6.2.2 Unicorn valuation, % GDP	1.8	24	
6.2.3 Software spending, % GDP	0.2	65	○ ◇
6.2.4 High-tech manufacturing, %	56.2	7	●
6.3 Knowledge diffusion	48.8	19	
6.3.1 Intellectual property receipts, % total trade	1.2	20	
6.3.2 Production and export complexity	93.4	4	◆
6.3.3 High-tech exports, % total trade	27.9	6	◆
6.3.4 ICT services exports, % total trade	1.6	68	○
6.3.5 ISO 9001 quality/bn PPP\$ GDP	7.0	41	

Creative outputs 58.2 5

7.1 Intangible assets	79.4	2	●◆
7.1.1 Intangible asset intensity, top 15, %	63.4	32	
7.1.2 Trademarks by origin/bn PPP\$ GDP	119.0	7	◆
7.1.3 Global brand value, top 5,000	16.8	6	
7.1.4 Industrial designs by origin/bn PPP\$ GDP	24.3	3	●◆
7.2 Creative goods and services	39.2	11	
7.2.1 Cultural and creative services exports, % total trade	0.7	42	
7.2.2 National feature films/mn pop. 15-69	5.0	23	
7.2.3 Entertainment and media market/th pop. 15-69	50.8	16	
7.2.4 Creative goods exports, % total trade	5.0	12	◆
7.3 Online creativity	34.9	33	◇
7.3.1 Generic top-level domains (TLDs)/th pop. 15-69	9.5	43	◇
7.3.2 Country-code TLDs/th pop. 15-69	8.0	44	◇
7.3.3 GitHub commits/mn pop. 15-69	45.5	24	
7.3.4 Mobile app creation/bn PPP\$ GDP	76.6	15	

NOTES: ● indicates a strength; ○ a weakness; ◆ an income group strength; ◇ an income group weakness; * an index; + a survey question, ● indicates that the economy's data are older than the base year; see appendices for details, including the year of the data, at <https://www.wipo.int/gii-ranking>. Square brackets [] indicate that the data minimum coverage (DMC) requirements were not met at the sub-pillar or pillar level.



→ Data availability

The following tables list indicators that are either missing or outdated for Republic of Korea.



> Republic of Korea has missing data for two indicators and outdated data for three indicators.

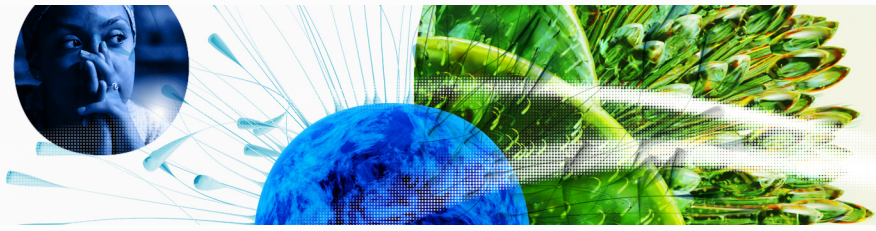
> Missing data for Republic of Korea

Code	Indicator name	Economy Year	Model Year	Source
4.1.3	Loans from microfinance institutions, % GDP	n/a	2021	International Monetary Fund, Financial Access Survey (FAS)
5.1.2	Firms offering formal training, %	n/a	2019	World Bank Enterprise Surveys

> Outdated data for Republic of Korea

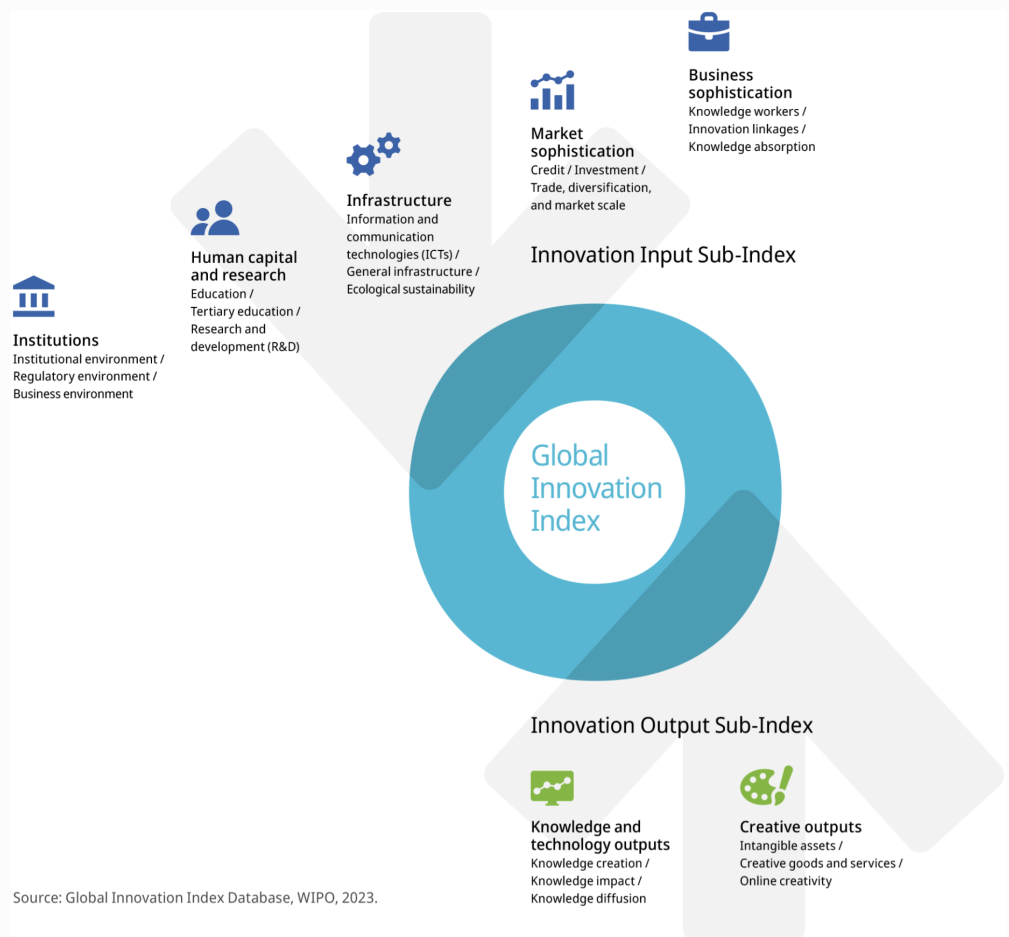
Code	Indicator name	Economy Year	Model Year	Source
2.1.1	Expenditure on education, % GDP	2019	2021	UNESCO Institute for Statistics
4.3.2	Domestic industry diversification	2019	2020	United Nations Industrial Development Organization
6.2.4	High-tech manufacturing, %	2019	2020	United Nations Industrial Development Organization

Global Innovation Index 2023



→ About the Global Innovation Index

- The Global Innovation Index (GII) is published by the World Intellectual Property Organization (WIPO), a specialized agency of the United Nations.
- Recognizing that innovation is a key driver of economic development, the GII aims to provide an innovation ranking and rich analysis referencing around 130 economies. Over the last decade, the GII has established itself as both a leading reference on innovation and a “tool for action” for economies that incorporate the GII into their innovation agendas.



The Index is a ranking of the innovation capabilities and results of world economies. It measures innovation based on criteria that include institutions, human capital and research, infrastructure, credit, investment, linkages; the creation, absorption and diffusion of knowledge; and creative outputs.

The GII has two sub-indices: the Innovation Input Sub-Index and the Innovation Output Sub-Index, and seven pillars, each consisting of three sub-pillars.